S15 54s

BIOSTATISTICS 547/GS01-0023: Survival Analysis

Course Outline, Spring 2015

Lectures: Monday, Wednesday 1:30-3:00 pm

Location: FCT4.6057

Instructors: Nabihah Tayob, Ph.D. Postdoctor fellow (1st half semester)
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Recommended Readings: (All books have been placed on reserve)

Klein JP and Moeschberger ML. *Survival Analysis* Springer, 1997
Collett, D. Modelling *Survival Data in Medical Research*, Chapman & Hall/CRC, 1999

Reference Books: * indicates books to be referenced during the second part**

1. Kalbfleisch and Prentice. The Statistical Analysis of Failure Data
2. Hosmer and Lemeshow. Applied Survival Analysis
3. Therneau and Grambsch. Modeling Survival Data
4. Anderson, Borgan, Gill, and Keiding. Statistical Models Based on Counting Processes
5. Philip Hougaard: *Analysis of Multivarite Survival Data*, Springer, 2000 ***
6. Martin Crowder, *Classical Competing Risks*, 2001 ***

Grading:

20% Project, 20% homework, 30% Midterm Exam, 30% final presentation

Course Outline

TOPIC

1. Introduction to survival analysis and time-to-event data
   - Notation
   - Censoring and Truncation

2. Parametric Methods: Basic Quantities
   - Common parametric models
   - Likelihood theory

3. Nonparametric Methods for One Sample Estimation
   - Product-limit Estimator
   - Nelson Cumulative Hazard Estimator

4. Nonparametric Methods for Two Sample Tests
   - Logrank Test
   - Weighted Tests
   - Stratified Tests
   - Tests for Trend

5. Parametric Regression Analysis
   - Accelerated Failure time model
   - Weibull Regression
   - Log-logistic Regression

6. How to Use R/Splus to estimate covariate coefficients under the Cox model, interpretation of parameters, intuitive derivation of partial likelihood, Breslow estimator and model checking

7. Semiparametric AFT model, interpretation of parameter, estimation methods, model checking and R

8. Analyze left-truncation and interval censoring – data, parametric likelihood and semiparametric modeling;

9. Estimation and inference for length-biased sampling; R/Splus under Cox model and AFT models

If you have a documented disability that will impact your work in this class, please contact one of us to discuss your needs. Additionally, you will need to register with the Disability Support Services Office in the Ley Student Center.